DEBUGGING EMBEDDED SYSTEMS

ABSTRACT OF THE DISCLOSURE

An embedded system is provided with the capability to be debugged. The embedded system includes a central processing unit (CPU) that is coupled to a bus having certain contents. A register, also with contents, is available for loading by the CPU. Finally, a debug logic circuit is also included. The debug logic circuit is coupled to both the bus and the CPU. The debug circuit itself is composed of a breakpoint detect circuit that is coupled to the bus and to the register. This circuitry enables a breakpoint signal that is produced by the breakpoint detect circuit when the contents of the register equal the contents of the bus. A method is also provided for debugging an embedded system having a microcontroller with a CPU. First, a debug logic circuit that resides on the same chip as the microcontroller is programmed to detect a predetermined condition in the microcontroller. Next, application software is run on the microcontroller. When a predetermined condition is detected, the CPU is interrupted which provides the ability to view the condition of the microcontroller. Programming the debug logic circuit can include the storing of a breakpoint address in a breakpoint address register. Afterward, a program memory address bus is selected for comparison to the contents of the breakpoint address register, upon which time a breakpoint counter is set to zero. The steps of interrupting and detecting are accomplished by comparing the contents of the program memory address bus to the contents of the breakpoint register and, if they are equal, then the CPU is interrupted.